EXHIBIT
14

EXPERT REPORT OF GOURANG PATEL, Pharm.D, MSc., BCPS, BCCCP, FCCP, FCCM

Terry Lynn King v. Tony Parker et al., Case no. 3:18-cv-01234 (M.D. Tenn.)

I. Introduction

My name is Gourang Patel, B.S. Chem, PharmD, MSc, FCCM, BCPS, BCCCP. A true and accurate copy of my curriculum vitae is attached as Exhibit 1.

I have been asked to review the Tennessee Lethal Injection Execution Manual Execution Procedures for Lethal Injection (Rev. July 5, 2018) ("the Protocol") to render a professional opinion concerning the Plaintiff's allegations in the case of Terry Lynn King v. Tony Parker et al., Case No. 3:18-cv-01234 (M.D. Tenn.) about the efficacy of the Protocol and the risk of pain and suffering to death sentenced inmates.

It is my opinion that the Protocol does not present a substantial risk that is sure or very likely to result in pain and suffering to a condemned inmate. Instead, based upon the chemicals used, the preparation, the dose and order of administration, the Protocol will result in the inmate being insensate during the transition to death. All of the opinions provided herein are based to a reasonable degree of scientific, pharmacologic, and medical certainty. I provide these opinions based on the materials I have reviewed and information currently known to me, and reserve the right to amend or supplement my opinion based on additional information provided.

II. Background and Qualifications

My current position is as a Clinical Pharmacist in the areas of Critical Care and Perioperative area at the University of Chicago Medicine (UCM). My duties include working directly with the physician, nurse, and medical team on evaluating medication therapy for patients in the Intensive Care Unit. During the evaluation my role is to review all medications a patient is being administered

and perform an assessment of efficacy and safety. I oversee the prescription, administration, and preparation of both compounded and commercially manufactured drugs, which includes their storage and transport. In order to evaluate the medications appropriately requires incorporating the principles of pharmacology. Pharmacology focuses on the understanding of pharmacokinetics/pharmacodynamics. Pharmacokinetics describes what our body does to a drug or medicine after it is either ingested or injected intravenously into the body. Pharmacodynamics describes what the clinical or biologic effect the drug or medicine has on our body after entering the circulatory system.

In addition to my intensive care unit duties, I also maintain and have developed a long-standing practice within the perioperative area. The perioperative area (otherwise more familiar as the operating room and procedural areas) entails the same responsibilities as described above with a more exhaustive list of medications for different surgeries and procedures which occur throughout the UCM campus. My role requires familiarity with the practice and evaluation of commercially manufactured and compounded drugs, including high risk sterile compounds utilized in Anesthesia Pain Management, generally and the specific drugs in Tennessee's Lethal injection procedures (midazolam, vecuronium bromide and potassium chloride).

In addition to my clinical duties, as an Associate Professor in the Rush Medical College and Departments of Pulmonary and Critical Care Medicine and Anesthesiology, I have taught medical and nursing students, perfusionists, certified registered nurse anesthetists (CRNA), and pharmacy students in the areas of pharmacology and clinical drug effects at Rush University. I have presented within the areas described above and specifically relating to subject of sterile compounding/high per USP Chapter <797>, USP Chapter <800>, aseptic technique, and applicable pharmacy regulations in my current position and during the course of my career. (GPatel CV pg.12 #23)

The fees for my time in regards to consulting and testimony in this case are as follows:

- $350/hr for record review
- $2,400 for Deposition (4 hr)
- $6,000 for Trial testimony (1 day)

In the last 4 years, I have provided testimony at trial or by deposition in 21 cases. A list of these cases has been attached as Exhibit 2.

III. Materials Reviewed and Relied Upon

1. Tennessee Department of Correction Lethal Injections Execution Manual, Execution Procedures for Lethal Injection, Rev., July 5, 2018 ("the Protocol");
2. Reports of Dr. Michaela Almgren, PharmD and Dr. Craig Stevens, PhD.
3. Depositions: Drug Procurer, Pharmacist, Pharmacy Owner, Executioner, and IV Team members
4. Plaintiff's Deposition Exhibits #1-80
5. Scientific literature cited throughout this report

IV. The Protocol

A. Lethal Injection Chemicals

The Protocol provides that the chemicals used in lethal injection (LIC) will either be FDA-approved commercially manufactured drugs or will be compounded sterile preparations (CSP) prepared in compliance with pharmaceutical standards within the United States.[1,2] FDA-approved commercially manufactured medications are prepared by a drug manufacturer and then sent to a

wholesaler and on to the pharmacy that orders them.[3] Alternatively, compounded medications are prepared from bulk active pharmaceutical ingredients (API), often by a compounding pharmacy, and often require diluents, pH buffers, and stabilizers to facilitate them for administration.[2] Compounded medications are commonly required when higher concentrations of a drug are needed or due to lack of availability from the commercial manufacturer through normal channels of procurement.

B. **Administration of Lethal Injection Chemicals**[4]

The Protocol calls for three drugs to be used in lethal injection. Specifically, the procedure calls for the intravenous administration of the drugs as follows:

1. **Midazolam**[4]- two syringes (50mL each) of 5mg/mL concentration for a total of 500mg (Labeled Syringe #1 and Syringe #2)

2. **Saline** - 50mL (Labeled Syringe #3)

Consciousness check - following the administration of Midazolam 250mg x2 syringes and then 50mL of saline and a two-minute waiting period, the Warden performs a consciousness check. The Warden assesses the consciousness of the condemned inmate by brushing the back of his hand over the inmate's eyelashes, calling the condemned inmate's name loudly two times, and then grabbing the trapezius muscle of the shoulder with his thumb and two fingers and twisting. If the Warden determines that the inmate is unconscious, he directs the Executioner to continue with the administration of the second and third chemicals.[5]

3. **Vecuronium bromide**[4]- Powder is reconstituted with bacteriostatic water known as sterile water for injection (SWFI). Vecuronium is drawn up into two 50mL syringes with a concentration of 1mg/mL. (Labeled Syringe #4 and Syringe #5)

4. **Saline** - 50mL (labeled Syringe #6)

5. **Potassium chloride**[4]- two syringes of 60mL each with a concentration of 2 mEq/mL (Labeled Syringe #7 and Syringe #8)

6. **Saline** - 50mL (Labeled Syringe #9)

Following the completion of the protocol for lethal injection, there is a five-minute waiting period. The Warden asks the Physician to enter the room to conduct an examination of the inmate. The Physician reports his findings to either the Warden or designee.[5]

Contingency provision-The TDOC protocol also contains a contingency provision if the consciousness check of the inmate following the initial midazolam administration indicates that the inmate is still conscious. Two additional syringes of Midazolam 250mg/syringe are already prepared and ready to be administered to the inmate. Thereafter, the Warden conducts another consciousness check before proceeding with the second and third drugs.[6]

V. Drugs & Their Effects

The expected clinical effects from the midazolam, vecuronium bromide, and potassium chloride are based on their chemical and pharmacologic properties.

A. Midazolam

The drug midazolam falls under a drug category known as sedative-hypnotics. The drug class is designed to suppress the central nervous system (brain), resulting in a significant depressed level of consciousness and awareness.[7,8,9] The following areas will address the mechanism of action (how the drug works), pharmacologic properties, effects on the body, and the current clinical uses of the drug.

1. Mechanism of action

Midazolam is classified as a benzodiazepine. Benzodiazepine's mechanism of action are described as drugs which bind to the gamma-aminobutyric acid (GABA) receptor, specifically $GABA_A$. After binding to the GABA receptor, benzodiazepines promote the binding of the main inhibitory neurotransmitter in the brain called GABA. (see Figure below)[7,8,9]

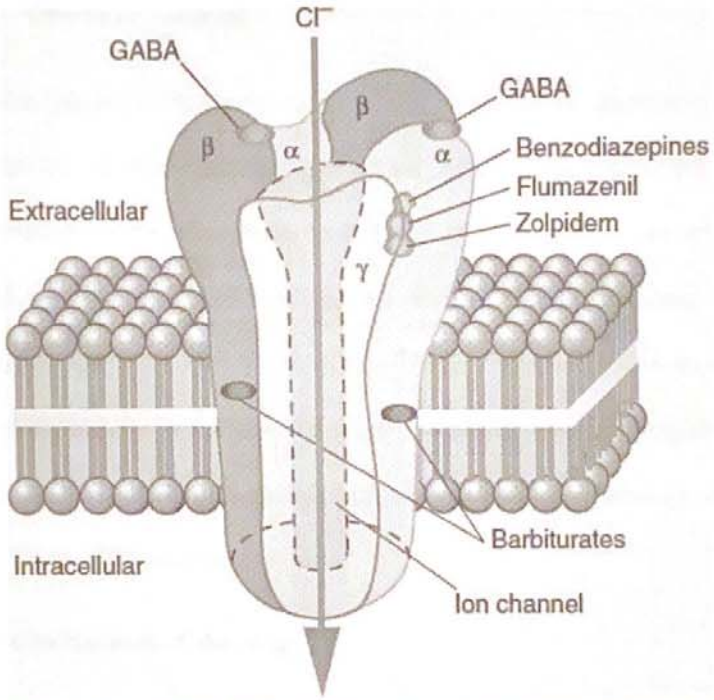

FIGURE 22–6 A model of the $GABA_A$ receptor-chloride ion channel macromolecular complex. A hetero-oligomeric glycoprotein, the complex consists of five or more membrane-spanning subunits. Multiple forms of α, β, and γ subunits are arranged in different pentameric combinations so that $GABA_A$ receptors exhibit molecular heterogeneity. GABA appears to interact at two sites between α and β subunits triggering chloride channel opening with resulting membrane hyperpolarization. Binding of benzodiazepines and the newer hypnotic drugs such as zolpidem occurs at a single site between α and γ subunits, facilitating the process of chloride ion channel opening. The benzodiazepine antagonist flumazenil also binds at this site and can reverse the hypnotic effects of zolpidem. Note that these binding sites are distinct from those of the barbiturates. (See also text and Box: The Versatility of the Chloride Channel GABA Receptor Complex.)

The neurotransmitter GABA is found in high concentrations in the brain including the cortex and limbic system. Once the GABA binds to the GABA receptor the result is inhibition of

brain neuronal activity; otherwise described as a loss of consciousness and awareness.[10]

2. **Pharmacologic properties**

Midazolam possesses significant lipophilic properties. The significance of this property is that it allows the drug to quickly penetrate the brain to cause its clinical effects. Drug onset is 30-60 seconds after intravenous injection and the peak effect of the drug is within 2 minutes. (Midazolam Product labeling. Akorn.8.2018)

3. **Effects on the body**

GABA is the major inhibitory neurotransmitter in the brain; therefore, the clinical and biologic effects related to the depression of brain activity are decreased awareness and consciousness. The depth of the two clinical features for benzodiazepines are related to the drug, dose, and route of administration. Midazolam also decreases cerebral (brain) blood flow and exhibits dose-dependent decrease in respiration. In addition to decreased muscle tone in the upper airway, midazolam flattens the respiratory response to elevated carbon dioxide (CO_2). In other words, as the CO_2 level increases it would not trigger the patient to increase respirations, thus limiting a physical response to increased CO2.[7,8,9]

4. **Clinical uses of the drug**

Midazolam is utilized as a procedural anesthetic, induction agent in anesthesia, and in the intensive care unit while patients are on a mechanical ventilator or life support.[11] In regards to the procedures, low dose midazolam is commonly utilized for procedures such as cardiac catherization and endoscopy. However, when an increased level of the depth of sedation and level of consciousness are needed then escalating doses are required.[9,11]

One such procedure in which Midazolam is utilized as the sole agent is called rapid sequence

intubation (RSI). The RSI procedure itself entails administration of 2-3 medications prior to a provider placing a plastic tube (called endotracheal tube (ET)) into the patient's airway so they can breathe with the assistance of a machine. The plastic tube then provides a connection to the mechanical ventilator. Midazolam is the first drug administered at a dose of 0.2-0.3 mg/kg. The second drug administered in the RSI procedure is a paralytic agent (ex. Rocuronium, Succinylcholine, or Vecuronium) and thereafter the patient has placement of the ET in their airway. The procedure is very painful and triggers the patients to cough and gag while the ET is placed in their airway.[12,13] The role of midazolam administration for this procedure is to provide relaxation of the airway muscles while inducing an amnestic effect.[8]

B. Vecuronium Bromide

Vecuronium Bromide is in a class of agents referred to as neuromuscular blockers (NMB).[14] The following areas will address the mechanism of action (how the drug works), pharmacologic properties, effects on the body, and the current clinical uses of the drug.

1. Mechanism of action

Neuromuscular blockers are classified as either depolarizing agents or non-depolarizing agents. The distinction is that depolarizing agents (succinylcholine) produce neuromuscular blockade by continually activating (depolarizing) the membrane/junction to the point the receptor can no longer be activated by the neurotransmitter acetylcholine (Ach). Non-depolarizing neuromuscular blockers will block the N_M receptor from Ach activation. The sub-group class Vecuronium belongs to is referred to as non-depolarizing NMB.

Vecuronium works on a set of receptors in the body called Nicotinic receptors, specifically N_M receptors. Vecuronium blocks the N_M receptors from being activated by acetylcholine (Ach). The

N_M receptor, when activated, is responsible for diaphragm muscles (that assist with breathing) and muscle contraction/movement.[13,14,16]

2. **Pharmacologic properties**

Vecuronium is manufactured and stable as a lyophilized powder. Prior to administration, the drug needs to be reconstituted with sterile water for injection (SWFI). Typical clinical doses of vecuronium are 0.1 mg/kg. After administration the vecuronium will take effect within 2-3 minutes. As vecuronium does not affect the level of consciousness it is recommended to administer an anesthetic sedative prior to vecuronium; hence the RSI procedure in which the Midazolam is administered prior.[15]

3. **Effects on the body**

After the administration of Vecuronium the person loses the ability move their skeletal muscles (arms, legs, etc) which eventually progresses to flaccid paralysis. In addition, other skeletal muscles which are affected are the diaphragm muscles. The diaphragm muscles assist the lungs to inflate (inspiration) and deflate (expiration) so that the body can exchange fresh oxygen from the air and remove carbon dioxide (CO_2) from the body. NMB of the diaphragm muscles eventually progresses and the person loses their ability to use the lungs to breathe.[14,16]

4. **Clinical uses of the drug**

The major clinical use for NMB is to provide muscle relaxation. Vecuronium is utilized as an adjunct to provide full skeletal muscle relaxation during surgery, endotracheal intubation (placement of the airway tube as described above in RSI), and provide skeletal muscle relaxation while a patient is on the mechanical ventilator (breathing machine/life support).[14,15,16]

C. **Potassium Chloride**

Potassium is an electrolyte in the body which maintains a higher concentration inside cells in our body than in the bloodstream/plasma.[17] The following areas will address the mechanism of action (how the drug works), pharmacologic properties, effects on the body, and the current clinical uses of the drug.

1. **Mechanism of action**

Organ systems which are dependent on membrane depolarization (activity) are most affected by changes in blood potassium levels as there exists a balance between sodium (Na) and potassium (K) concentrations. The electrolytes (Na/K) act within a pump called the sodium/potassium (Na/K) pump. The Na/K pump facilitates an electrical charge in regards to cardiac (heart) conductance (electrical activity) and muscle contraction. Therefore, imbalances in potassium levels lead to disturbances in electrical activity of the heart.[17,18]

2. **Pharmacologic properties**

Potassium chloride injection after injection transported into cells in the body in an effort to re-establish the equilibrium and balance between the Na/K ions. Potassium chloride can be obtained in injectable formulations to facilitate rapid replacement of the electrolyte.[18]

3. **Effects on the body**

Potassium chloride replacement re-establishes a normal equilibrium between the Na/K ions. The equilibrium of potassium ions facilitates normal conductance (electrical activity) for normal muscle contraction and cardiac activity.[18] In a circumstance in which elevated level of potassium is present (> 7 mmol/L) can trigger abnormal cardiac conduction (electrical) activity causing it to stop. (Weiss J. CircArrhythmElectrophysiol.2017)

4. **Clinical uses of the drug**

Potassium chloride injection is administered in the treatment of low potassium levels (hypokalemia) within the bloodstream. Examples of the etiology or cause of the hypokalemia can be secondary to excessive diuresis and severe diarrhea (or gastrointestinal losses).[17,18]

VI. Opinions

1. My opinion is that TDOC's procurement and utilization of commercially manufactured and/or compounded LICs will not result in or cause the inmate to experience pain or suffering in the lethal injection execution process. TDOC's lethal injection manual describes the LIC being utilized for lethal injection are either FDA-approved commercially manufactured drugs or shall be compounded preparations prepared in compliance with pharmaceutical standards.[1,2,19] Pharmaceutical standards are set forth by the United States Pharmacopeia (USP) for Pharmacies engaged in compounding sterile preparations. Compounding pharmacies ensure the CSPs are correctly prepared, sterilized, packaged, labeled, sealed, stored, and dispensed. The preparation of the compounded medication takes place in a designated area of the pharmacy with appropriate air flow and environmental controls.[2]

TDOC obtains all medications from a licensed Pharmacy which dispenses the midazolam, vecuronium, and potassium chloride.[19,22] (Deposition Drug Procurer pg.72) It is not uncommon that FDA-approved manufactured drugs are not available via standard pharmaceutical supply chains. The American Society of Health-System Pharmacists (ASHP) reported a range of 58 to 267 new drug shortages every year from 2001-2021. Currently there are at least 220 active drug shortages as of quarter 3 of 2021.[20] Of those 220 drug shortages 63% are injectable medications; therefore, it is expected the next line of procurement would be from Compounding Pharmacies.[20]

The compounding pharmacy orders the active pharmaceutical ingredient (API) from the wholesaler and then utilizes a process of dilution/filtration to obtain the finalized sterile injection. The

medication compounded by the pharmacy technician and pharmacist occurs in a clean and sterile environment. In compliance with pharmaceutical standards the medications are tested to evaluate the medication identity, strength, quality, and purity.[2] The midazolam and potassium chloride are compounded sterile preparations (CSPs) prepared by the Pharmacy, and vecuronium bromide is an FDA-approved manufactured medication. (Deposition-Pharmacist pg.28)

The Pharmacist outlined the procedure for sending the sample of the CSPs for testing in regard to potency/strength and sterility as recommended by USP standards.[2,19] (Deposition Pharmacist pg.160) The accepted standard by USP for label strength is within 10% and prepared to maintain sterility until the beyond use date (BUD). Meaning the acceptable potency is between 90-110%.[2] BUD is assigned either from direct testing or from scientific literature. The practice of compounding pharmacies also incorporates testing for accuracy (potency), sterility, and endotoxins. USP recommendations for drug storage include 24 hours at room temperature, 3 days at cold temperature (fridge), and 45 days in the freezer for high risk level CSPs (ex. Midazolam and Potassium chloride).[2] The vecuronium bromide is manufactured by a FDA-approved manufacturer; therefore, no such additional independent testing is recommended nor required.

Once the pharmacy is ready to ship the CSPs (midazolam and potassium chloride) and vecuronium it is packaged in dry ice with a temperature gauge device to facilitate safe transport to TDOC. (Deposition Pharmacy Owner pg.109 and Pharmacist pg. 178) Once received by TDOC, the LICs are stored in a separate building, secured via a steel lock on the fridge and freezer, and recorded in a log by drug name and expiration date all in accordance with USP recommendations.[21,23] The pharmacy also provides details guiding the storage of the CSPs which also are in alignment with USP recommendations. For example, for the CSPs of Midazolam and Potassium chloride the Pharmacy outlined specifically the instructions for storage, supplies needed for preparation, and a step-by-step

procedure for preparation.[21,23,24,25] The standards for storage demonstrated by TDOC is as good or better than the standards used by/for most patients regarding storage of compounded drugs. As compounded medications are used in the home setting, even these medications are stored with food items and the temperature is not recorded in a temperature log. In fact, TDOC initiated extra steps to store the medications in a separate fridge/freezer which was segregated from food items and has a temperature probe monitor on the outside to track the temperature as well.[30,31]

Once TDOC is ready to administer the LIC, the CSPs are removed from the freezer (-25^0 to -10^0 C) and placed into the refrigerator as instructed to allow the medication to thaw. (Deposition-Pharmacist pg. 195) The CSPs are stable for 3 days in the fridge (temperature 2^0 to 8^0 C); therefore, this is an acceptable recommendation and in alignment with pharmaceutical standards.[26] The day of the execution, the Executioner prepares the medications for lethal injection with another witness as redundancy (double) check for safety with syringe labeling. (Deposition Executioner pg. 135-141)

The inmate is prepared for lethal injection by first obtaining intravenous (IV) access. The EMTs place an IV line (one in each arm) in a large antecubital fossa area (arm near the inner middle portion of the elbow) where saline is first tested to ensure the IV is functional.[27] The line placement is targeted for the antecubital fossa or the large vein on each side of the inmate's inner arm near the middle of the elbow. The IV line set up utilizes the following: 2 bags of 0.9% sodium chloride, 2 solution sets, 2 hemostats, extension sets, and tape. The expiration dates of the 0.9% sodium chloride are checked as well prior to placement of the IV lines by the IV team.[27]

Standards for point of care use by patients are similar to those demonstrated and used at an execution. The pharmacy provides detailed instructions for drug storage, supplies required for reconstitution, and reconstitution of the medication prior to administration.[24,25]

The Pharmacy provided detailed instructions to TDOC for the CSPs of midazolam and

potassium chloride. The instructions outline the storage conditions for the CSP until needed for use, supplies needed for reconstitution, and step by step instructions for preparation the day of use. The details are inclusive of precautions, avoiding any contamination, and aseptic technique throughout the process. In addition, the instructions also highlight visual inspection of the reconstituted medication prior to administration.[24,25,28] All of the above instructions are what would be provided to the lay public in their home when utilizing a CSP.[2]

Based upon the following facts my opinion is that TDOC lethal injection manual will not result in pain and suffering to the inmate. First, TDOC procures the LIC from a licensed Pharmacy which prepared the CSPs in accordance to the pharmacopeia guidelines, the Pharmacy sends the CSP samples for analytical testing, shipment of the CSPs occurs in temperature sensitive packaging, and detailed instructions regarding supplies and step-by-step instructions for preparation are provided by the Pharmacy. Second, TDOC has a secure and separated storage for the LICs to ensure the specific storage specifications, as set forth by the Pharmacy, were adhered to as well. Lastly, TDOC's lethal injection protocol details specific instructions regarding intravenous (IV) line placement, double checking the inmate's IV line is safe for drug administration before proceeding with the lethal injection, and implementing a double check of syringe preparation/labeling the day of the execution all of the precautions which provide a safer overall process.

2. My opinion is that following administration of the three chemicals as provided in the Protocol will result in the inmate being insensate. The first drug administered in the protocol is midazolam.[4] Midazolam's mechanism of action, as described above, focuses on increasing the activity of endogenous GABA which is the major inhibitory neurotransmitter in the brain.[7] Midazolam injection demonstrates a dose-dependent effect (higher the dose → higher the effect) on the level of consciousness. Pain is a subjective feeling that is dependent on affective, sensory, and cognitive

variables. Midazolam has been demonstrated to effect experiences of pain in a dose-dependent fashion.[29] Midazolam disrupts the pathways of neuronal (electrical) activity between the key regions of the brain integrated to the perception and anticipation of pain; therefore, it is an appropriate drug for lethal injection.[29] As midazolam is an acceptable first drug for RSI to facilitate a depressed level of consciousness, more likely than not it is acceptable to administer prior to vecuronium.[13] The second drug administered in the lethal injection protocol is vecuronium bromide.[4] The vecuronium administration will result in complete paralysis of the skeletal muscles inclusive of those of the diaphragm used to assist with breathing.[14] The dose of vecuronium administered is sufficient to result in respiratory arrest and death. The third drug administered according to the lethal injection protocol is potassium chloride.[4] Potassium chloride administration will result in triggering cardiac conduction (electrical) abnormalities and disruptions that will result in cardiac arrest and death.

3. I have reviewed the reports of Dr. Michaela Almgren and Dr. Craig Stevens. Those reports contain nothing that alter my opinions herein, namely, that the Protocol is not sure or very likely to result in pain and suffering to inmates.

Respectfully,

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Gourang Patel, BS Chem, PharmD, MSc, BCPS, BCCCP, FCCP, FCCM

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Gourang P. Patel, B.S. Chem, PharmD, MSc., BCPS, BCCCP, FCCM, FCCP

Curriculum Vitae

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Experience

March 2020	Clinical Pharmacist- Critical Care and Perioperative area Clinical Coordinator- Anesthesia and Surgery Department of Pharmacy University of Chicago Chicago, IL
July 2002 – March 2020	Pharmacy Supervisor- Adult Critical Care and Perioperative Care Associate Professor Division of Pulmonary and Critical Care Medicine Department of Anesthesiology Department of Pharmacy RUSH Medical College RUSH University Medical Center Chicago, Illinois

Post-Doctoral Training

July 2001-June 2002	Internal Medicine Pharmacy Residency John Cochran VA Medical Center Saint Louis, Missouri Residency Director: Jennifer Kasiar, Pharm.D., BCPS

Educational Training

August 1992- May 1996	Truman State University Kirksville, Missouri	**B.S. Degree in Chemistry**
August 1996-May 2001	St. Louis College of Pharmacy Saint Louis, Missouri **Magna Cum Laude**	**Doctor of Pharmacy**
August 2006-June 2008	Rush Graduate College Clinical Research Program Chicago, Illinois	**Master of Science**

Professional Experience

August 2009-2019	Associate Professor Department of Internal Medicine RUSH Medical College Chicago, IL
July 2009-July 2014	Clinical Site Coordinator Critical Care Residency (PGY2) Midwestern University Chicago Colleges of Pharmacy Site: RUSH University Medical Center Chicago, IL
November 2003-2019	Adjunct Instructor Advanced Practice Nursing Northern Illinois University [NIU]
November 2003-2019	Assistant Professor Department of Internal Medicine RUSH Medical College Chicago, IL
August 2002-2019	Adjunct Assistant Professor Division of Pharmacy Practice Chicago Colleges of Pharmacy Midwestern University Downers Grove, IL
August, 2001- June, 2002	Clinical Instructor Division of Pharmacy Practice Saint Louis College of Pharmacy St. Louis, MO
October, 2000-July 2011	Pharmacist Walgreen's Pharmacy Saint Louis, Missouri Chicago, Illinois
May 2015- Present	Associate Professor Department of Anesthesiology

Editorial Board

January 2019 – Present	Critical Care Medicine

Journal/Publication Reviewer

August 2016	Society of Critical Care Medicine (SCCM) SCCM Annual Critical Care Congress and Symposium January 2017 meeting Abstract Reviewer
January 2014	Journal of Critical Care Manuscript Reviewer
January 2010	Pharmacoepidemiology and Drug Safety Manuscript Reviewer
June 2009	American College of Chest Physicians ACCP Annual Meeting Abstract Reviewer
July 2008-Present	Pharmacotherapy Manuscript Reviewer Critical Care/Infectious Diseases
September 2007	Society of Critical Care Medicine (SCCM) SCCM Annual Critical Care Congress and Symposium February 2008 meeting Abstract Reviewer
June 2007- Present	University Health-System Consortium (UHC) Monograph Reviewer Drug Information
December 2005-Present	Annals of Pharmacotherapy Manuscript Reviewer Critical Care/Infectious Disease

Hospital Committees

- Critical Care Quality Committee- 2005-2020
  Member
- Emergency Resuscitation Committee-
  Member 2002-2008
  Co-Chair 2008-2011
- Surgical Quality Improvement Committee- 2010-2020
  Member
- Pharmacy and Therapeutics Committee- 2010-2020
  Member

Publications

Textbook Chapter

1. **Patel GP** and Tedford S. Chapter 21 The Evolving Role of the Pharmacist in Clinical, Academic, and Industry Sectors. Drug Discovery and Development. 3rd edition. CRS Press. 2019

2. Critical Care Pharmacy Preparatory Review and Recertification Course's. Chapter-Practice Administration and Development: Protocol Development and Quality Assurance Reviewed by: **Gourang Patel**, PharmD, MSc, FCCM, BCPS, BCCCP and Russel Roberts, PharmD, FCCM. 2019, 2020, and 2021

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4. Acute Pulmonary Embolism in Adults. 2017 PSAP Chapter Book 2 pg. 67-95. American College of Clinical Pharmacy. By Sandy Bartlett, PhD, PharmD and Gwen Bartlett, PharmD.
   Reviewed by: **Gourang Patel**, PharmD, MSc and Gina Lumbard Harper, PharmD

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Articles

1. Beckamn E, Hovey S, Bondi DS, **Patel GP**, and Parrish RH. Pediatric Perioperative Clinical Pharmacy Practice: Clinical Considerations and Management. *Journal of Pediatric Pharmacology and Therapeutics*. Accepted, ahead of print. November 2021

2. Roberts R, Miano T, Hammond D, **Patel GP**, et al. Evaluation of Vasopressor Exposure and Mortality in patients with Septic Shock [VOLUME-CHASERS]. *Crit Care Med*. 2020;48: 1445-1453.

3. Benken S, Madrzyk E, Chen D, et al. Hemodynamic Effects of Propofol and Dexmedetomidine in Septic Patients without Shock. Ann Pharmacother.2019;54: 533-540.

4. **Patel GP**, Hyland SJ, Birrer KL, et al. Perioperative clinical pharmacy practice: Responsibilities and scope within the surgical care continuum. *J Am Coll Clin Pharm*.2019;3: 501-519.

5. Menich BE, Miano TA**, Patel GP**, and Hammond DH. Norepinephrine and Vasopressin compared with Norepinephrine and Epinephrine in Adults with Septic Shock. *Ann Pharmacother.* 2019;53: 877-885.

6. Lopansri B, Miller R, Burke J, et al. Physician agreement on diagnosis of sepsis in the intensive care unit: estimation of concordance and analysis of underlying factors in a multicenter cohort. *Journal of Intensive Care*. 2019;7: 1-17.

7. Nelson K**, Patel GP**, Hammond DH. Effects from continuous infusions of dexmedetomidine and propofol on hemodynamic stability in critically ill adult patients with septic shock. *J Intensive Care Med*. 2020;35: 875-880.

8. Miller RR, Lopansri BK, Burke JP, Levy M, Opal S, Rothman RE, D'Alessio FR, Sidhaye VK, Aggarwal NR, Balk R, Greenberg JA, Yoder M, **Patel G**, et al. Validation of a Host Response Assay, Septicyte™ LAB, for Discriminating Sepsis from SIRS in the ICU. *Am J Resp Crit Care.* 2018;198:903-913.

9. DeMott JM, **Patel G**, Lat I. Effects of chronic antihypertensives on vasopressor dosing in septic shock. *Ann Pharmacother*. 2018;52:40-47

10. Caffarini E, DeMott J, **Patel G**, Lat I. Determining the clinical utility of an absolute procalcitonin (PCT) value for predicting a positive culture result. *Antimicrob Agents Chemother.* 2017;61:1-6.

11.Falana O, **Patel G**. Efficacy and Safety of Tranexamic Acid versus Aminocaproic Acid in Cardiovascular Surgery. *Ann Pharmacother*.2014; 48:1563-9

12. **Patel GP**. The management of substance abuse in the critically ill. *Dis Mon*. 2014; 60:428-440.

13. Elpern E, Killeen K, **Patel GP**, Senecal P. The Application of Intermittent Pneumatic Compression Devices for Thromboprophylaxis. *Am J Nurs*. 2013;113:30-36

14. Kiel PJ, Vargo CA, **Patel GP**, Rosenbeck LL, and Srivastava S. Possible correlation of sirolimus plasma concentrations with sinusoidal obstructive syndrome of the liver in patients undergoing myeloablative allogeneic hematopoietic cell transplantation. *Pharmacotherapy*. 2012; 32:441-5

15. **Patel, GP**. Postmortem Drug Levels: Innocent Bystander or Guilty as Charged. *J Pharm Pract*; 2012; 25:41-44

16. **Patel, GP** and Balk RA. Systemic Steroids in Severe Sepsis and Septic Shock. *Am J Respir Crit Care Med*.2012; 185:133-139.

17. Rech MA, Prasse MC, **Patel GP**. Use of Vasopressors in Septic Shock. *JCOM*. 2011; 18:273-277

18. **Patel GP**, Crank CW, Leikin JB. An evaluation of Hepatotoxicity and Nephrotoxicity of Liposomal Amphotericin B (L-AMB). *J Med Tox*. 2011; 7:12-15

19. Peterson SJ, Chen Y, Sullivan CA, Kinnare KF, Tupesis NC, **Patel GP**, Sowa DC, Lateef O, Sheean PM. Assessing the influence of registered dietitian order-writing privileges on parenteral nutrition use. *J Am Diet Assoc*. 2010; 100:1703-11

20. Crank CW, Scheetz MH, Brielmaier B, Rose WE, **Patel GP**, Ritchie DJ, Segreti J. Comparison of Outcomes from Daptomycin or Linezolid Treatment for Vancomycin-Resistant Enterococcal Bloodstream Infection. *Clin Ther*. 2010; 32:1713-1719

21. Gurnani PK, **Patel GP**, Crank CW, Vais D, Lateef O, Akimov S, Balk RA, and Simon D. Impact of the Implementation of a Sepsis Protocol for the Management of Fluid-Refractory Septic Shock: A Single-Center, Before-and-After Study. *Clin Ther*. 2010; 32:1285-1293

22. **Patel GP,** Grahe JS, Sperry M, Singla S, Elpern E, Lateef O, Balk RA. Efficacy and Safety of Dopamine versus Norepinephrine in the Management of Septic Shock. *Shock.* 2010 April; 33:375-380

23. **Patel GP**. A focus on medication safety in the intensive care unit. *Curr Drug Safety.* 2010 Jan; 5:1

24. **Patel GP** and Kane-Gill S. Medication Error Analysis: A Systematic Approach. *Curr Drug Safety.* 2010 Jan; 5: 2-5

25. Elpern EH, Killeen K, Ketchem A, Wiley A, **Patel GP**, Lateef O. Reducing use of indwelling urinary catheters and associated urinary tract infections. *Am J Crit Care.* 2009 Nov; 18: 535-541

26. **Patel GP**, Simon D, Scheetz M, Crank CW, Lodise T, Patel N. The effect of time to antifungal therapy on mortality in Candidemia associated septic shock. *Am J Ther*. 2009 Nov-Dec; 16:508-511

27. Kleinpell RM, **Patel GP**. Pneumonia in Older Adults. *Adv. Nurse Prac*. September 2009; 17:43-47

28. Low-Molecular Weight Heparins: Update on Follow-On "Generic" Compounds (Part 2). Co-Chairs: Tapson V and Marcus P. Faculty: **Patel GP** and Groce J. *Chest Physician* August 2009: 16-17

29. Low-Molecular Weight Heparins: Update on Follow-On "Generic" Compounds (Part 1). Co-Chairs: Tapson V and Marcus P. Faculty: **Patel GP** and Groce J. *Chest Physician* July 2009: 16-17

30. Low-Molecular Weight Heparins: Patient Safety and Clinical Data Requirements for Follow-on "Generic" Biologic Compounds. Co-Chairs: Tapson VF, Marcus P. Faculty: Fareed J, **Patel GP**, Talarico L, Groce JB. *Chest Physician* supplement. September 2008: 1-15

31. Kiel PK**,** Lo M, Stockwell D, **Patel GP**. An Evaluation of Amikacin Nephrotoxicity in the Hematology/Oncology Population. *Am J Ther*. 2008; 15: 131-136

32. **Patel GP** and Balk RA. Choice of vasopressor in septic shock: does it matter? *Critical Care*. 2007,11:174

33. Elpern EH, **Patel GP**, Balk RA. Antibiotic Therapy for Pulmonary Exacerbations in Adults with Cystic Fibrosis. *Medsurg Nurs*. 2007;16: 293-298. Continuing Education (CE).

34. Gueret R**, Patel GP,** Simon DM, Balk RA. Invasive Aspergillosis: Case Report and Review of the Approach to Diagnosis and Treatment. *Clinical Pulmonary Medicine*. 2007;14: 197-205

35. **Patel GP,** Elpern EH, Balk RA. A Campaign Worth Joining: Improving Outcome in Severe Sepsis and Septic Shock Using the Surviving Sepsis Campaign Guidelines. *South Med J.* 2007;100: 557-8

36. **Patel GP,** Crank CW, Black S. Therapeutic Interventions for the Treatment and Control of Influenza. *J Pharm Technol*. 2007;23:79-85

37. **Patel GP,** Balk RA. Recognition and Treatment of Hyponatremia in Acutely Ill Hospitalized Patients. *Clin Ther*. 2007;29: 211-229

38. **Patel GP**, Loh-Trivedi M. Clinical Pharmacists in the Intensive Care Unit: Is there really an equation? *Intensive Care Med*. 2006 Aug; 32(8):1275-6

39. Philbrick AH, Crank CW, **Patel GP**. Antiretrovirals: Pharmacotherapy and Adverse Drug Reactions. *Inet Continuing Education.* 2005; 9(5):1-21. InetCE 221-999-05-010-H02. Released: August 2005

40. Crank CW, **Patel GP**. Antimicrobial Resistance in Gram-Positive and Gram-Negative Bacteria. *Inet Continuing Education.* 2005; 9(4):1-19. InetCE 221-999-05-009-H01. Released: July 2005

41. **Patel GP**, Liberman J, Gurka D, Elpern E, Balk RA. Complications of Critical Illness: Rationale for Prophylactic Strategies. *Clinical Pulmonary Medicine*. 2005;12(4):258-268.

42. **Patel GP** and Crank CW- Management of Gram-Negative Resistance in the Intensive Care Unit. *Journal of Pharmacy Practice*. 2005;18:91-99.

43. **Patel GP**, Gurka D, Balk RA. Management of Sepsis and Septic Shock. *Curr Opin Crit Care*. 2003;9:390-396.

44. **Patel GP**, Balk RA. The Interaction of the Coagulation and Inflammatory Cascades in the Pathogenesis and Management of Severe Sepsis and Septic Shock. *Biomedical Progress* 16:2003

45. **Patel GP**, Kaisar JB. Syndrome of Inappropriate Antidiuretic Hormone- Induced Hyponatremia Associated with Amiodarone. *Pharmacotherapy* 2002;22 (5): 649-651.

46. Moerlein SM, Perlmutter JS, **Patel GP**, et al. Comparison of Carbon-11 andFluorine-18 Labeled (N-Methyl) Benperidol (NMB) in rodents Using MicroPet Imaging. *J Lab Comp Radiopharm* 2001;44:s455-s456.

Abstract/Poster Presentation

1. Magee C, Hammond D, Rech M, Mueller S, **Patel G**, et al. Ketamine in Critically Ill Adult Patients: Use, Perceptions, and Barriers. Society of Critical Care Medicine (SCCM). Virtual meeting. January 2021.

2. **Patel GP**, Nelson KM, Hammond D. Effects from Propofol and Dexmedetomidine in the Critically ill adults with Septic Shock. Society of Critical Care Medicine (SCCM) meeting. San Diego, CA. February 2019

3. Menich B, Miano T, **Patel GP**, Hammond D. Norepinephrine and Vasopressin versus Norepinephrine and Epinephrine in Adults with Septic Shock. Society of Critical Care Medicine (SCCM) meeting. San Diego, CA. February 2019

4. Benken S, **Patel GP**, Hammond D. Hemodynamic Effects of Propofol and Dexmedetomidine in Septic Patients without Shock. Society of Critical Care Medicine (SCCM) meeting. San Diego, CA. February 2019

5. Zouien E and **Patel GP**. Case presentation- Kombucha. Society of Critical Care Medicine (SCCM) meeting. San Antonio, TX. February 2018.

6. **Patel GP**, Buvanendran A, Rehman S, Gaurav K, Moric M, Robinson S, Kroin J. Opioid prescription patterns in a university academic Emergency Department. American Society of Anesthesiologists (ASA). Boston, MA. October 2017.

7. Caffarini E, DeMott J, **Patel G**, Lat I. Determining the utility of an absolute Procalcitonin (PCT) value. Society of Critical Care Medicine (SCCM) meeting. Honolulu, HI. January 2017.

8. Lai Y, Seddon A, Nathan S, DiGrazia L, **Patel GP**, Merchant N. Evaluation of Bortezomib with Methotrexate and Tacrolimus for Graft-Versus-Host Disease Prophylaxis in Allogenic Stem Cell Transplant Patients. Hematology Oncology Pharmacists Association (HOPA). March 2016

9. **Patel GP**, Berger K, O'Donnell P, DeMott J, Rechner G, Hanson A, Cooke J, Varghese M, Balk RA. Clinical pharmacist interventions with procalcitonin while performing antibiotic stewardship. Society of Critical Care Medicine (SCCM) meeting. Phoenix, AZ. January 2015.

10. Falana O, **Patel GP**. Efficacy and safety of tranexamic acid versus ε-aminocaproic acid in cardiovascular surgery. Society of Critical Care Medicine (SCCM) meeting. San Francisco, CA. January 2014

11. Malik N, **Patel GP**, Tandon R. Clinical Outcomes in patients with Group III associated pulmonary hypertension on prostacyclin therapy. American Thoracic Society (ATS). Philadelphia, PA. May 2013

12. **Patel GP**, Vais D, Gurnani P, Crank C, Kleinpell D, Simon D, Lateef O. A Multidisciplinary Approach to Improve Outcomes in Patients with Septic Shock. American College of Chest Physicians (ACCP) *Oral slide Presentation*. San Diego, CA. October 2009

13. **Patel GP,** Crank CW, Leikin JB. An Evaluation of Hepatotoxicity and Nephrotoxicity of Liposomal Amphotericin B. North American Congress of Clinical Toxicology. NACCT. San Antonio, TX. September 2009

14. **Patel GP** and Leikin JB. Reversal of Ventricular Tachycardia (VT) from Lidocaine with Amiodarone. North American Congress of Clinical Toxicology. NACCT. San Antonio, TX. September 2009

15. Vais D**, Patel GP,** Gurnani P, Crank C, Simon D. An Approach to Improve Outcomes in Patients with Septic Shock. International Congress of Chemotherapy and Infection 26th session. Toronto, Canada. June 2009

16. **Patel GP**, Kleinpell R, Ward E, Lateef O, Altman P, and Gonzaga M. Improving Sepsis Care Practices Through Multidisciplinary Initiatives. RUSH University Medical Center Research Forum. Chicago, IL. May 2009

17. Moreno-Franco P, Mahajan N, Simon-Grahe J, **Patel GP**, Lee W, Tandon R. Outcome of Pulmonary Hypertension Patients who required Endotracheal Intubation with Intensive Care Unit Admission. American Thoracic Society (ATS) meeting. Toronto, Canada. May 2008

18. **Patel GP,** Sperry M, Yoder MA, Simon-Grahe J, Balk RA. Efficacy and Safety of Dopamine versus Norepinephrine in the Management of Septic Shock. Society of Critical Care Medicine (SCCM). *Oral Presentation* at the Annual Meeting. Honolulu, HA. February 2008.

19. **Patel GP**, Crank CW, Loh-Trivedi M, Balk RA. An Evaluation of Nephrotoxicity of Liposomal Amphotericin B. American College of Clinical Pharmacy (ACCP). Denver, CO. October 2007

20. Brielmaier BD, Reichley R, Casabar E, Ledeboer N, **Patel GP**, Crank CW, Segreti J, Ritchie DJ. Daptomycin for Treatment of Vancomycin-resistant Enterococcus Bloodstream Infections. American College of Clinical Pharmacy (ACCP). Denver, CO. October 2007

21. Kumar A, Skrobik I, Guzman J, Lapinsky S, Laupland K, Dodek P, Zanotti S, **Patel GP**, Simon D, and the CATTS Investigators. The High Mortality of Candida Septic Shock is Explained by Excessive Delays in Initiation of Antifungal Therapy. Interscience Conference of Antimicrobial Agents and Chemotherapy (ICAAC). Chicago, IL. September 2007

22. Kiel PJ, **Patel GP**, Stockwell D, Fung H. Evaluation of Nephrotoxicity Regarding Aminoglycoside Dosing in a Hematology/Oncology Population. American Society of Health-Systems Pharmacy (ASHP) meeting. Anaheim, CA. December 2006

23. Tverdek F, **Patel GP**, Crank CW. Assessment of the Treatment of Hospital and Ventilator Associated Pneumonia at a University Hospital. American Society of Health-Systems Pharmacy (ASHP) meeting. Anaheim, CA. December 2006

24. Simon-Grahe J, Shashaa S, **Patel GP**, Elpern E, and Balk, RA. Incidence and Outcome of Vasopressor Resistance in Septic Shock. American College of Chest Physicians (ACCP) meeting. Salt Lake City, Utah. October 2006

25. **Patel GP,** Akimov S, Santos C, Wang Y, Crank CW, Balk RA, Simon D. Assessing Antibiotic Administration in Patients With Septic Shock. Infectious Disease Society of America (IDSA) meeting. Toronto, Canada. October 2006

26. **Patel GP,** Crank CW, Proia L, Simon-Grahe J, Simon D. Candidemia associated Septic Shock. Infectious Disease Society of America (IDSA) meeting. Toronto, Canada. October 2006

27. **Patel GP**, Simon-Grahe J, Balk RA. An Evaluation of Adrenal Function and Infecting Pathogen in Septic Shock American Thoracic Society (ATS) meeting. San Diego, CA. May 2006

28. Simon-Grahe J, **Patel GP**, Elpern E, and Balk, RA. Physiologic stressed cortisol levels in vasopressor-dependent septic shock correlate with 28-day mortality American Thoracic Society (ATS) meeting. San Diego, CA. May 2006

29. Bell J, Simon-Grahe J, **Patel GP**, Balk RA. Etiologic Cause of Septic Shock Is Not Associated With Duration of Vasopressor Therapy Or 28 Day Mortality American Thoracic Society (ATS) meeting. San Diego, CA. May 2006

30. Grimm S, Cannon J, Lee T, Crank C, **Patel GP**, Proia L, Labuszewski L, Mullane K, Jancel T, Clark N. Utilization of Newer Antifungals in a Large Metropolitan Setting. FOCUS on Fungal Infections. Las Vegas, NV. March 2006

31. Reimann M, Crank C, **Patel GP**, Flint N. Evaluation of Aminoglycoside and Vancomycin Therapeutic Drug Monitoring American Society of Health-Systems Pharmacists (ASHP) Mid-Year meeting. Las Vegas, NV. December 2005

32. Simon-Grahe J**, Patel GP,** Elpern E, Balk RA. The Safety of Dopamine versus Norepinephrine as Vasopressor Therapy in Septic Shock American College of Chest Physicians (Chest) meeting. Montreal, Canada. October 2005

33. Simon-Grahe J**, Patel GP,** Elpern E, Kellar D, Balk RA. Dopamine versus Norepinephrine as the Initial Vasopressor in Septic Shock American Thoracic Society (ATS) meeting. San Diego, CA. May 2005

34. **Patel GP**, Patel P, Gurka D, Elpern E. Economic Evaluation of Sedation and Analgesia in Medical Intensive Care Unit American Society of Health-System Pharmacists (ASHP) Mid-Year meeting. New Orleans, LA. December 2003

35. Patel P, **Patel GP**. Evaluation of Stress Ulcer Prophylaxis with Pantoprazole in Medically Ill Patients American Society of Health-System Pharmacists (ASHP) Mid-Year meeting. New Orleans, LA. December 2003

Presentations

1. Perioperative Care PRN Focus Session—*Saddle Up: State of the Art Perioperative Pain Management* Activity Number: 0217-0000-20-136-H08-P 1.50 hours of CPE credit. American College of Clinical Pharmacy (ACCP) annual meeting. October 2020. Moderator- Gourang Patel, PharmD

2. Drug Withdrawal Syndromes in the ICU. Society of Critical Care Medicine- SCCM Multiprofessional Critical Care Adult Course. Chicago, IL. *August 2020 and 2021*.

3. Pharmacotherapy challenges in Critically ill Patients. Society of Critical Care Medicine- SCCM Multiprofessional Critical Care Adult Course. Chicago, IL. August 2019.

4. "Slow to Wake: Managing Delayed Emergence in the Postsurgical Setting". American College of Clinical Pharmacy ACCP Global meeting. Perioperative PRN Focus Session. OR Blues: Management of Perioperative Emergencies. Seattle, WA. October 2018.

5. "Reducing Opioid use in Orthopedic Surgery". American Association of Orthopedic Surgery [AAOS]. New Orleans, LA. March 2018

6. "Perioperative Analgesia". Midwest Orthopedics at Rush. Grand Rounds. April 2017.

7. "Life-Threatening Infections: Diagnosis and Antimicrobial Therapy Selection". Fundamentals in Critical Care Support [FCCS] program for the Society of Critical Care Medicine [SCCM]. Chicago, IL. August 2016

8. "Technology in the ICU- an arranged marriage between Telemedicine and Telepharmacy", Speaker. Society of Critical Care Medicine (SCCM). 45th Annual Congress. Orlando, FL. January 2016

9. " Which Box Does Your Patient Fit into to? Method behind the madness for vasopressor selection", Speaker. Society of Critical Care Medicine (SCCM). 45th Annual Congress. Continuing Education (CE). Orlando, FL. January 2016

10. “Bleeding Jeopardy”. Speaker. Society of Critical Care Medicine (SCCM). 45th Annual Congress. Continuing Education (CE). Orlando, FL. January 2016

11. “Perioperative Medication Dosing in the Obese Patient”. Department of Anesthesiology-Grand Rounds. January 2016

12. “Perioperative Medication Safety”. Department of Anesthesiology-Grand Rounds. December 2015.

13.”Flumazenil: Then and Now”. American Academy of Clinical Toxicology/American Board of Applied Toxicology (AACT/ABAT). Journal Club presentation-Webinar. October 2015.

14. ”Vasoactive therapies in the ICU”. Illinois Academy of Physician Assistants (PA). Continuing Education. Chicago, IL. October 2015.

15. “Life-Threatening Infections: Diagnosis and Antimicrobial Therapy Selection”. Fundamentals in Critical Care Support [FCCS] program for the Society of Critical Care Medicine [SCCM]. Chicago, IL. March 2015

16. “Emerging Therapies for Idiopathic Pulmonary Fibrosis (ILD) and the Role of Specialty Pharmaceuticals”. National Association of Specialty Pharmaceuticals [NASP]. Continuing Education (CE). Orlando, FL. October 2014

17. “Life-Threatening Infections: Diagnosis and Antimicrobial Therapy Selection”. Fundamentals in Critical Care Support [FCCS] program for the Society of Critical Care Medicine [SCCM]. Chicago, IL. August 2014

18. “Pharmagologic parameters for the Obese ICU patient” American College of Physicians [ACP] Annual Conference. Continuing Education (CME). Orlando, FL. April 2014

19. “Pain, Agitation, and Delirium in the ICU” Speaker, American College of Physicians [ACP] Annual Conference. Continuing Education (CME). San Francisco, CA. April 2013

20. “Drug-Induced Arrhythmia’s in the ICU” Speaker, Society of Critical Care Medicine (SCCM) 40th Annual Conference. Continuing Education (CE). San Diego, CA. January 2011

21. “Managing Hyponatremia: Challenges & Opportunities for the Hospital Pharmacist” Moderator and Speaker. Illinois Council of Health-System Pharmacists (ICHP). Continuing Education (CE). Oak Brook, IL. August 2011

22. “A Pharmacist approach to a patient with septic shock” 5th Annual Sino-American Hospital Pharmacy Conference. Nanjing, China. May 2010

23. 2010 JPT International Intravenous Conference: Intravenous medication compounding and safety. “Aseptic technique for compounding sterile products” and “USP Chapter <797>” Beijing, China. May 2010

24. “An approach to the management of delirium in the ICU” Illinois Council of Health-System Pharmacists (ICHP). Spring Meeting. Bloomington, IL. March 2010

25. Vancomycin resistant *Enterococcus* (VRE). Society of Critical Care Medicine (SCCM): ICU Infection in an Era of Multi-Resistance. 8th Summer Conference in Intensive Care Medicine Chicago, IL. June 2009

26. "One Prokinetic Agent versus Two for Gastrointestinal Motility" Presented at the American Society of Parenteral and Enteral Nutrition (ASPEN) conference. *Presenter.* New Orleans, LA. February 2009

27. "Hyperglycemia Management in the ICU" Presented at the American Society of Parenteral and Enteral Nutrition (ASPEN) conference. *Session Moderator and Presenter.* New Orleans, LA. February 2009

28. "Catecholamines at the ICU Bedside: Which is the best?" Presented to the Department of Pharmacology, Seminar Series. Rush University Medical Center. Chicago, IL. November 2008.

29. "Safety and Therapeutic Interchange of Generic Low-Molecular Weight Heparins" Presented at American College of Chest Physicians ACCP Roundtable meeting. Philadelphia, PA. October 2008.

30. "Therapeutic Interchange and Generic Low-Molecular Weight Heparins" Presented at the North American Thrombosis Forum (NATF) meeting at Brigham's and Women's Hospital. Boston, MA. September 2008.

31. "Safety of Follow-on Biologic Medications: Implications for Anticoagulants" Continuing Education Program. Presented at the American College of Chest Physicians ACCP meeting. Huntington Beach, CA. March 2008.

32. "Balancing Propofol and Nutrition in the Intensive Care Unit" Pragmatic Approach to Nutrition in the Intensive Care Unit. Continuing Education Program. Presented at RUSH University Medical Center. Chicago, IL. November 2007.

33. Advanced Critical Care & Trauma Symposium. *Program Consultant and Speaker.* Continuing Education (American Association of Critical Care Nurses AACCN, Accreditation Council for Continuing Education AMA, American Academy of Physician Assistants ACCME, and Accreditation Council for Pharmacy Education ACPE)

"Adverse Effects of Sedation and Analgesia in the ICU"
"Evaluation and Treatment of Delirium in the ICU"
"An Approach to Bleeding in the ICU: A Focus on Pharmacotherapy"
Chicago, IL. November 2007

34. "An Evaluation and Treatment Approach to Hyponatremia in the Hospitalized Patient" Alabama Society of Health System Pharmacists (AlSHP) Annual Meeting. Continuing Education (ACPE) Birmingham, AL. October 2007

35. "A Evaluation of Treatment Strategies for the Treatment of Hyponatremia in Acutely Ill Patients" Presented to Mayo Clinic Nephrology Fellows. Rochester, MI. April 2007

36. "Pharmacologic Considerations in the Intensive Care Unit: Nutrition" Pragmatic Approach to Nutrition in the Intensive Care Unit. Continuing Education Program. Presented at RUSH University Medical Center. Chicago, IL. November 2005.

37. “Management of Sedation and Analgesia in the Intensive Care Unit” Illinois Council of Health-System of Pharmacists (ICHP) Annual Meeting. Continued Medical Education (ACPE). Oak Brook, IL. September 2005.

38. “Therapeutic Management of Gram-Positive and Gram-Negative Resistance” Medicine Grand Rounds, Continuing Medical Education (CME). Presented at St. Joseph Hospital. Chicago, IL. April 2005

39. “Update on the ACCP-Chest Guidelines for Prevention of Venous Thromboembolism” Presented to RUSH University Medical Center Pulmonary and Critical Care Fellows. Chicago, IL. March 2005

40. “Approaches to Resistance in Community Acquired Pneumonia” Medicine Grand Rounds, Continuing Medical Education (CME). Presented at Oak Park Hospital. Oak Park, IL. February 2005

41. “Management of COPD Exacerbation in the Intensive Care Unit” Presented to University of Chicago and Michael Weiss Memorial Hospital Residents/Interns. Chicago, IL. February 2005

42. “Acute Coronary Syndromes-Nursing Approach to Intravenous Treatment Strategies” Presented at Centegra’s Fall Nursing Symposium-Continuing Education (CE). Woodstock, IL. September 2004

43. “Acute Coronary Syndromes-A Focus on Reperfusion Therapies” Presented to RUSH University Medical Center Cardiology and Critical Care Fellows. Chicago, IL. August 2004

44. “Approach to Invasive Fungal Infections in Critically Ill Oncology Patients” Presented to Northwestern Memorial Hospital Hematology and Oncology Fellows. Chicago, IL. July 2004

45. “Advances in Antifungal Pharmacology and Update in Candida Guidelines” Pulmonary and Critical Care and Infectious Disease Fellows, Moderator/Presenter Presented to UIC, RUSH, and Loyola Medical Center Chicago, IL. March/April 2004

46. “Strategies for Venous Thromboembolism and Stress Ulcer Prophylaxis in Medically Ill Patients” Medicine Grand Rounds Presented to RUSH Medical Center Residents/Interns, Continuing Medical Education (CME), RUSH University Medical Center, Chicago, IL. November 2003

47. “Critical Appraisal of Surveillance Data for Community Acquired Respiratory Pathogens” Presented to Attending Physicians in Chicagoland Area, Four Seasons Hotel, Chicago, IL. November 2003

48. “Application of Evidence Based Medicine in the Treatment of Community Acquired Pneumonia” Presented to St. Mary’s Internal Medicine Residents, St. Mary’s Hospital, Chicago, IL. October 2003

49. “Application of Community Acquired Pneumonia Guidelines in an Urgent Care Center” Presented to Attending House Staff, Sherman Medical Center, Algonquin, IL. September 2003

50. “Treatment Approach to Resistant Gram-Positive Infections” Presented to Northwest Community Hospital Pharmacy Staff, Arlington Heights, IL. July 2003

51. “Cardiovascular Pharmacology- RUSH Cardiology Review” Continuing Education Program Presented to RUSH-SLMC Cardiology Fellows, RUSH-Presbyterian St. Luke’s Medical Center, Chicago, IL. August 2002

52. “Bioterrorism” Continuing Education Program Presented to Saint Louis Area Pharmacists, Saint Louis College of Pharmacy, St. Louis, MO. February 2002

53. “Sepsis: A New Treatment Approach with Activated Protein C” Continuing Education Program Presented to Saint Louis Area Pharmacists, Saint Louis College of Pharmacy Saint Louis, MO. October 2001

54. “Sepsis: A New Treatment Approach with Activated Protein C” Medicine Grand Rounds Presented to Washington University and Saint Louis University Residents, John Cochran VA Medical Center, Saint Louis, MO. October 2001

55. “The Prevention and Treatment of Postmenopausal Osteoporosis” Presented to Indian Society of Physicians of Saint Louis, Ghandi Cultural Center, Saint Louis, MO. October 2001

56. “Clopidogrel vs. Ticlopidine after Coronary Artery Stent Placement” Doctor of Pharmacy Seminar, Presented to Saint Louis College of Pharmacy Faculty, Saint Louis, MO. January 2001

57. “The Role of Cofactors in Metabolism” Inorganic Chemistry Research Thesis Presented t0 Chemistry Faculty, Truman State University, Kirksville, MO. May 1996

Teaching Experience

Spring, 2001	PP 2100: Introduction to Pharmaceutical Care and Non-Prescription Drugs Weekly Group Discussion Leader
August, 2001- June2002	Clinical Instructor Division of Pharmacy Practice Saint Louis College of Pharmacy
Fall, 2001	TH 4001: Therapeutics I Weekly Group Discussion Leader
Fall, 2001	Resident Teaching Workshops Saint Louis College of Pharmacy An 18-hour workshop series designed to develop an understanding of knowledge, skills, and attitudes necessary to achieve student-centered, assessment driven learning.

Spring, 2002	CP 5700 Antimicrobial Pharmacotherapy (2 hours) Lecturer/discussion facilitator (Chloramphenicol, Quinupristin/Dalfopristin, Linezolid, and Vancomycin)
Spring, 2002	PP 2100 Introduction to Pharmaceutical Care and OTC Drugs Weekly discussion section leader
Spring, 2002	Preceptor for Pharm.D. Clinical Clerkships Chicago Colleges of Pharmacy Midwestern University
Fall, 2002	Preceptor for Pharm.D. PGY1 Residents Medical Intensive Care Unit rotation RUSH University Medical Center
August 2002-2010	Adjunct Assistant Professor Division of Pharmacy Practice Chicago Colleges of Pharmacy Midwestern University Therapeutic Issues in Critical Care-PPRA 0650 Course Director: Tudy Hodgman Pharm.D., BCPS, FCCM
November 2003-2010	Assistant Professor *Introduction to Pharmacology-Fluids and Electrolytes* *Acid-Base in the Intensive Care Unit* PRF 333 Department of Internal Medicine RUSH Medical College Chicago, IL
August 2005-August 2010	Assistant Professor Advanced Therapeutics Course 530D Pharmacotherapeutics - *Vasoactive Therapy in the Intensive Care Unit* - *Acute Coronary Syndromes: Focus on Reperfusion Therapies* College of Nursing RUSH Medical Center Chicago, IL
August 2009-August 2011	Assistant Professor Course: Medical Pharmacology RUSH Medical College Chicago, IL <u>Fall Quarter</u>: 20 contact hours - *Pharmacokinetics I and II* - *Autonomic Nervous System* <u>Winter Quarter</u>: 14 contact hours - *Cardiovascular Pharmacology*

August 2009-2014	Assistant Professor Course: Physiology and Pharmacology RUSH Graduate College Chicago, IL Fall Quarter: 25 contact hours - *Autonomic Nervous System* - *Cardiovascular Pharmacology* Spring Quarter: 3 contact hours - *Anticoagulant and antiplatelet therapies* - *Toxicology*
July 2011-July 2020	Assistant Professor Course Director Course: CDS 608 Pharmacology RUSH College of Health Sciences Audiology Pharmacology Curriculum- 30 contact hours
July 2011-July 2020	Assistant Professor Department of Anesthesiology Resident lectures: Pharmacology curriculum *Topics:* - *Pharmacokinetics [PK]* - *Pharmacodynamics [PD]* - *Protein binding/Drug dissociation* - *Drug dosing in obese patients*
May 2014-July 2020	Assistant Professor Nurse Anesthesia Program [CRNA] Course: NSG 542 Pharmacology Curriculum- 8 contact hours Topics: - Pharmacokinetics/Pharmacodynamics - Anaphylaxis - Drug-Drug Interactions
January 2016-July 2020	Assistant Professor Perfusion Pharmacology PRF 523 Course Director and lecturer- 9 contact hours
November 2018	Roosevelt College of Pharmacy Pharmacology- PHAR 632 Antiemetic therapies-1 hour Antiulcer therapies-1 hour
September 2021	Clinical Pharmacology Fellowship Co-Coordinator Biological Sciences Division University of Chicago

Simulation/Education Training

1. Loh-Trivedi M and **Patel GP** "Surviving Sepsis Campaign 2008: A Focus on Pharmacotherapy" Critical Care Simulation. Presented at the American College of Chest Physicians ACCP meeting. Philadelphia, PA. October 2008

2. **Patel GP** "Acute Management of Asthma" Critical Care Presentation. Presented at American College of Chest Physicians (ACCP) meeting. Austin, TX. March 2009

3. **Patel GP**. "Optimizing Sedation and Analgesia in the ICU" Critical Care Bundle Course. Presented at American College of Chest Physicians (ACCP). Dundee, IL. June 2009

4. Sung A and **Patel GP**. "Treatment Approaches for Pulmonary Hypertension in the ICU" Critical Care Bundle Course. Presented at American College of Chest Physicians (ACCP). Dundee, IL. June 2009

5. Loh-Trivedi M and **Patel GP** "Alternatives to Propofol sedation in the ICU: A review of current sedation and analgesia" Presented at the American College of Chest Physicians (ACCP) meeting. San Diego, CA. October 2009

6. **Patel GP**. "Life-Threatening Infections: Diagnosis and Antimicrobial Therapy". Fundamentals in Critical Care Support (FCCS) sponsored by the SCCM. August 2013 – August 2017

Community Service

Ronald McDonald House	January 2015
Chicago Food Depository	April 2016
Feed My Starving Children	September 2019

Honors and Awards

Society of Critical Care Medicine (SCCM) Presidential Citation: Contribution to Critical Care	January 2018
Society of Critical Care Medicine (SCCM) Presidential Citation: Contribution to Critical Care	January 2016
Member Spotlight Clinical Pharmacy and Pharmacology Section Newsletter Society of Critical Care Medicine (SCCM)	December 2012
Society of Critical Care Medicine (SCCM) Presidential Citation: Contribution to Critical Care	January 2011
GlaxoSmithKline Pharmaceutical Award in Patient Care	May 2001

Recipient of Mark A. Gasaway Scholarship	2000-2001
Recipient of Werner Scholarship	1999-2000
Saint Louis College of Pharmacy High Proficiency Scholarship	1997- 2001
Saint Louis College of Pharmacy Dean's List	1996-2000

Clinical Research/Grants

1. March 2003-August 2008
Trial: Randomized Trial of Norepinephrine versus Dopamine for Septic Shock
Site: RUSH University Medical Center, Medical Intensive Care Unit
Role: Primary Investigator
Funding: None

2. January 2005-June 2008
Trial: Prospective Review of Antibiotic Administration in Medical-Surgical Intensive Care Units for Septic Shock. Medical Intensive Care Unit and Emergency Department.
Site: RUSH University Medical Center
Role: Co-Investigator
Funding: Center for Clinical Research, RUSH Medical Center, amount of $1,000

3. January 2006-March 2008
Trial: Retrospective Review of Candidemia Associated Septic Shock
Site: RUSH University Medical Center
Role: Primary Investigator
Funding: None

4. June 2009-July 2010
Trial: The Role of Simulation training with Pharmacy Practice Residents (PGY1/PGY2) in order to reduce adverse events with intravenous medications
Site: RUSH University Medical Center Simulation Lab
Role: Primary Investigator
Funding: Center for Teaching Excellence/Midwestern University and Chicago Colleges of Pharmacy for $2,500

5. April 2015- April 2016
Trial: Validation of septic gene ExpressioN Using Septicyte (VENUS)
Site: Rush University Medical Center- Medical Intensive Care Unit
Role: Co- Investigator

6. June 2016- December 2017
Trial: Safety of Oliceridine (TRV130) in patients with acute pain for which parenteral opioid therapy is warranted
Site: Rush University Medical Center
Primary Investigator: Adam Young, MD-Anesthesiology
Role: Data Safety Monitoring Board (DSMB)

7. January 2017 – December 2019
Trial: Implementation of Pharmacy services in an out-patient CF clinic
Site: Rush University Medical Center
Role: Primary Investigator
Funding: Cystic Fibrosis Foundation (CFF) Grant for $87,480 over 3 years

8. June 2017 – July 2018
Trial: An evaluation of local anesthetic efficacy and safety Evaluation of Patient Safety Based on Cumulative Local Anesthetic Exposure in the Perioperative Area
Site: Rush University Medical Center
Role: Primary Investigator
Funding: Center for Clinical Research, RUSH University Medical Center, amount $2,000

Professional Affiliations/Leadership

American Academy of Clinical Toxicology (AACT)	2009-Present
Society of Critical Care Medicine (SCCM)	2002-Present
American College of Clinical Pharmacy (ACCP)	2002-Present
Perioperative PRN Secretary/*Treasurer* Chair	 2019-2020 2020-2021
Gateway College of Clinical Pharmacy	2000-2002
Rho Chi National Honor Society Beta-Kappa Chapter/ Member Saint Louis College of Pharmacy	1999- Present

Fellowships

The Institute of Medicine of Chicago (IOMC)	December 2015
American College of Critical Care Medicine (FCCM)	January 2017
American College of Clinical Pharmacy (FCCP)	October 2021

Current Licensure and Certification

Board Certified Critical Care Pharmacist (BCCCP)	November 2015
Basic Disaster Life Support (BDLS)	July 2008
Board Certified Pharmacotherapy Specialist (BCPS)	December 2002
Advanced Cardiac Life Support (ACLS)	November 2002
Registered Pharmacist by examination, Illinois	June 2002
Registered Pharmacist by examination, Missouri	October 2000
Basic Cardiac Life Support (BLS)	April 2000

Revised 12/2021

1. Rickleman v. St. Agnes Medical, File 22-9480 (Fresno, CA)
2. Andrade v. St. Agnes Medical, Claim 6482H20115946 (Fresno, CA)
3. Fastula v. Gamze, 2014 L 13441 (Chicago, IL)
4. Kennedy v. Kelley, (St. Clara, CA)
5. Madala v. Department of Public Health, (Philadelphia, PA)
6. Scheffler v. Advocate Christ Medical Center, (Chicago, IL)
7. Abenante v. Riverview Medical Center, MON-L-1782-15, (Westfield, NJ)
8. Public v. Husel, (Columbus, OH)
9. Lane v. Spectrum Health, (Grand Rapids, MI)
10. St. Pierre v. Williams, (Columbia, MO)
11. Piercebell v. Tony's Firehouse (Bakersfield, CA)
12. Johnson v. Firelands, File 2621-02-1110S-19 (Sandusky, OH)
13. Brewer v. Firelands, Sandusky, OH
14. Jones v. Care Options, (Lancaster, PA)
15. Sorrano v. Desert Springs Hospital Medical Center, (Desert Springs, AZ)
16. Lenzy v. Doylestown, (Philadelphia, PA)
17. Neville v. Cortez, 2442-25809C (Columbus, OH)
18. Hale v. University of Utah, (St. Lake City, UT)
19. Meija v. Home Care (Mesa, AZ)
20. Hatfield v. Genesis, (Columbus, OH)
21. Dotson v. King Medical, 20-CIA-001, (Portsmouth, OH)
22. Romer v. Dupage Medical Group, 18 L 09198, (Chicago, IL)